

**Notice of Allowability**

Application No.

10/017,733

Applicant(s)

LIANG ET AL.

Examiner

Art Unit

Daniel F. Hajnik

2671

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/25/2005.
2. ☒ The allowed claim(s) is/are 8-20, 23-27 and 31-47.
3. ☒ The drawings filed on 13 December 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All   b) ☐ Some\*   c) ☐ None   of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),  
Paper No./Mail Date 06/22/2005 6/21/2005
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

  
**RICHARD HJERPE**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2600**

***Response to Amendment***

1. In response to the amendment filed 3/25/2005:

The examiner acknowledges the amendment to pg. 6, line 29 – pg. 7, line 22 of the specification, and withdraws the objection from the previous office action dated 1/27/2005.

The examiner acknowledges the amendment to the preamble in claim 47, and withdraws the objection from the previous office action dated 1/27/2005.

**EXAMINER'S AMENDMENT**

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Richard T. Lyon on 6/21/2005.

The application has been amended as follows:

In claim 44, replace "the horizontal grid coordinate t o ne of the grid vertices" with "the horizontal grid coordinate of said different one of the grid vertices".

***Allowable Subject Matter***

2. Claims 8-20, 23-27, and 31-47 are allowed.

3. The following is an examiner's statement of reasons for allowance: The cited prior art does not teach or render obvious the combination of elements recited in the claims as a whole. Specifically, the cited prior art fails to disclose or render obvious the following limitations:

As per claim 8, the computer-implemented process of generating a video having interactive water effects using the combination of inputting a scene, generating a reflection copy of the scene, merging the input image and water region image, distorting the merged water region to simulate a ripple at a selected site, establishing a height map corresponding to the water region portion, displaying the merged image and inputting the location of each site selected by viewer, imposing a ripple mask onto the height map, and specifically, adding a height value representing a ripple amplitude of to the height location to viewer-selected location, and specifically, adding a height value represent a ripple amplitude of one half of the ripple amplitude to the height map points above, below, right, and left of the viewer-selected location and, specifically, adding a height value representing one fourth of the ripple amplitude to the height map locations directly diagonal from the viewer-selected location, and further computing new image coordinates for each location, moving a pixel or pixels associated with each location, and generating a sequence of additional frames with preceding ripple effects simulating to further simulate the natural motion of a ripple across a body of water.

As per claim 23, A system for generating a video having interactive water effects comprising inputting a computing device, a computer program, an image of a scene, generating a reflection copy of the scene, merging the input image and water region

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image, sizing the merged image to a desired frame size, distorting the water region portion of the merged image to simulate at least one ripple at a viewer selected site, distorting the water to simulate a periodic wave. The simulation of the periodic wave includes the limitations of establishing and generating a height map corresponding to the water region for each height map point, where the height map simulates the size and shape of the wave at a given on the surface of the body of water, and computing new image coordinates for each height map point where for each location of the periodic height values: specifically producing a combined left-side and right-side neighbor height value and subtracting the combined left-side neighbor height value from the combined right-side neighbor height value and dividing by a scaling factor to compute a horizontal translation value, and adding the horizontal translation value to the horizontal image coordinate of the merged image location under consideration to establish a new horizontal image coordinate, and specifically producing a combined upper and lower neighbor height value and subtracting the combined upper neighbor height value from the combined lower neighbor height value and dividing by a scaling factor to compute a vertical translation value, and adding the vertical translation value to the vertical image coordinate of the merged image location under consideration to establish a new vertical image coordinate, and moving a pixel or pixels associate with each location to the new image coordinates, and generating a sequence of additional images for simulating the natural motion of a ripple and a wave across a surface of a body of water utilizing the ripple or period wave simulated in the immediately preceding frame to produce additional frames.

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It is noted that the prior art of Colwell (US Patent 5,877,777) teaches in equation (4) on col 5, line 65, of taking differences of neighboring height values (as also seen in figure 3) to simulate waves using a height map. However, Colwell (5,877,777) does not teach of scaling these differences, or of separately calculating a horizontal and vertical translation value as described in claim 23, but rather Colwell (5,877,777) teaches of summing of both the horizontal and vertical translation values at once to calculate a combined difference value over a defined change in time ( $\Delta t$ ). Further, the claim language specifically states of subtracting the combined left side and right side neighborhood values from each other, and specifically states of subtracting the combined upper and lower side neighborhood values from each other. Equation (4) of Colwell (US Patent 5,877,777) teaches of adding these terms neighborhood values together in both cases.

As per claim 31, the computer process for generating a video depicting water effects comprising defining an orthogonal grid corresponding to the water region, establishing 4 corner vertices of the video frames, and specifically "specifying a height of a horizontal line which divides said upper and lower portions of the video frames based on a viewer-selected height value", specifying the number of horizontal grid lines, identify the grid coordinates of each vertex, inputting a texture map that is used in conjunction with a model of a scene to generate, generating a reflection copy of the texture map, merging the input texture map and water region texture map to create a combined texture map, superimposing the grid on the water region texture map, and rendering a sequence of video frames using a combined texture map, where each

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frame uses a separate combined texture map and where the associated grid vertices, except for the first frame, have been assigned height values which are derived from the immediately preceding frame in the sequence to simulate movement of the surface of the water.

It is noted that the prior art of Colwell (US Patent 5,877,777) teaches the claimed orthogonal grid in figure 6, and teaches in figure 12 a pool settings box for the user to control properties of the grid associated with the pool. However, Colwell (US Patent 5,877,777) does not teach of having the user specify a height for separating upper and lower portions of the video frames. Colwell (US Patent 5,877,777), figure 12, teaches of user (viewer) controls for controlling the grid properties such as pool mesh width and pool mesh density, and further figures 6 and figure 12 of Colwell (US Patent 5,877,777) make no mention nor suggests the combination of a user specifying the height for the horizontal dividing line to divide the video frames between the two claimed portions and the claimed pool mesh (orthogonal grid).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nomi et al. (US Patent 6030289), Watt et al., Delura et al., Broadman et al., and Kass. (See form 892)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel F. Hajnik whose telephone number is (571) 272-7642. The examiner can normally be reached on Mon-Fri (8:30A-5:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka J. Chauhan can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DFH 6/21/2005



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